

# **Report on WEPAN 2003 Conference**

## **Women in Engineering Programs & Advocates Network**

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# Overview of Today's Seminar

Debby Quock

- WEPAN History and Mission
- Student Outreach Programs

Kirsten Laurin-Kovitz

- WEPAN Keynote Speakers

Eve Gohoure

- Mentoring Programs

Dongqi Li

- Diversity Awareness Training

# WEPAN History

**WEPAN**, Women in Engineering Programs & Advocates Network, is a national non-profit educational organization founded in 1990. WEPAN was established to effect a positive change in the engineering infrastructure conducive to the academic and professional development of women and men.

**WEPAN** is supported by three centers located at Purdue University, University of Michigan, and Stevens Institute of Technology. The organization is led by a 14-person board of directors from academia and industry and has a membership of over 600 individuals representing nearly 200 engineering schools, fortune 500 corporations and non-profit organizations.

**WEPAN** is currently the designated financial administrator of the *AT&T Labs Fellowship Program* and served as the incubator for *MentorNet*, the national electronic industrial mentoring program for women in engineering and science.

**WEPAN's mission is to be a catalyst for change to enhance the success of women in the engineering profession.**

## **WEPAN Programs**

### **K-12 Student Programs**

- Hands-on activities to introduce students to engineering

### **Professional Training Seminars**

- Recruitment and retention of women in engineering and science at the pre-college, undergraduate and graduate levels
- Professional business skills

### **National Conferences**

- WEPAN 2004 - Albuquerque, New Mexico

### **International**

- Global Alliance for Diversifying the Science and Engineering Workforce is a collaborative initiative of the American Association for the Advancement of Science (AAAS), Association for Women in Science (AWIS) and the Women in Engineering Programs & Advocates Network (WEPAN).

# WEPAN National Recognition

**PRESS CLIP Date:** April 16, 2003

## **President Bush Honors Nation's Leading Science, Math and Engineering Mentors**

Washington, DC - The White House today announced 10 outstanding individuals and six organizations that will receive the *Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring* in a ceremony in Washington, DC on Tuesday, March 18. Those honored have achieved remarkable results in increasing the participation of minorities, women and disabled students in science, mathematics and engineering.

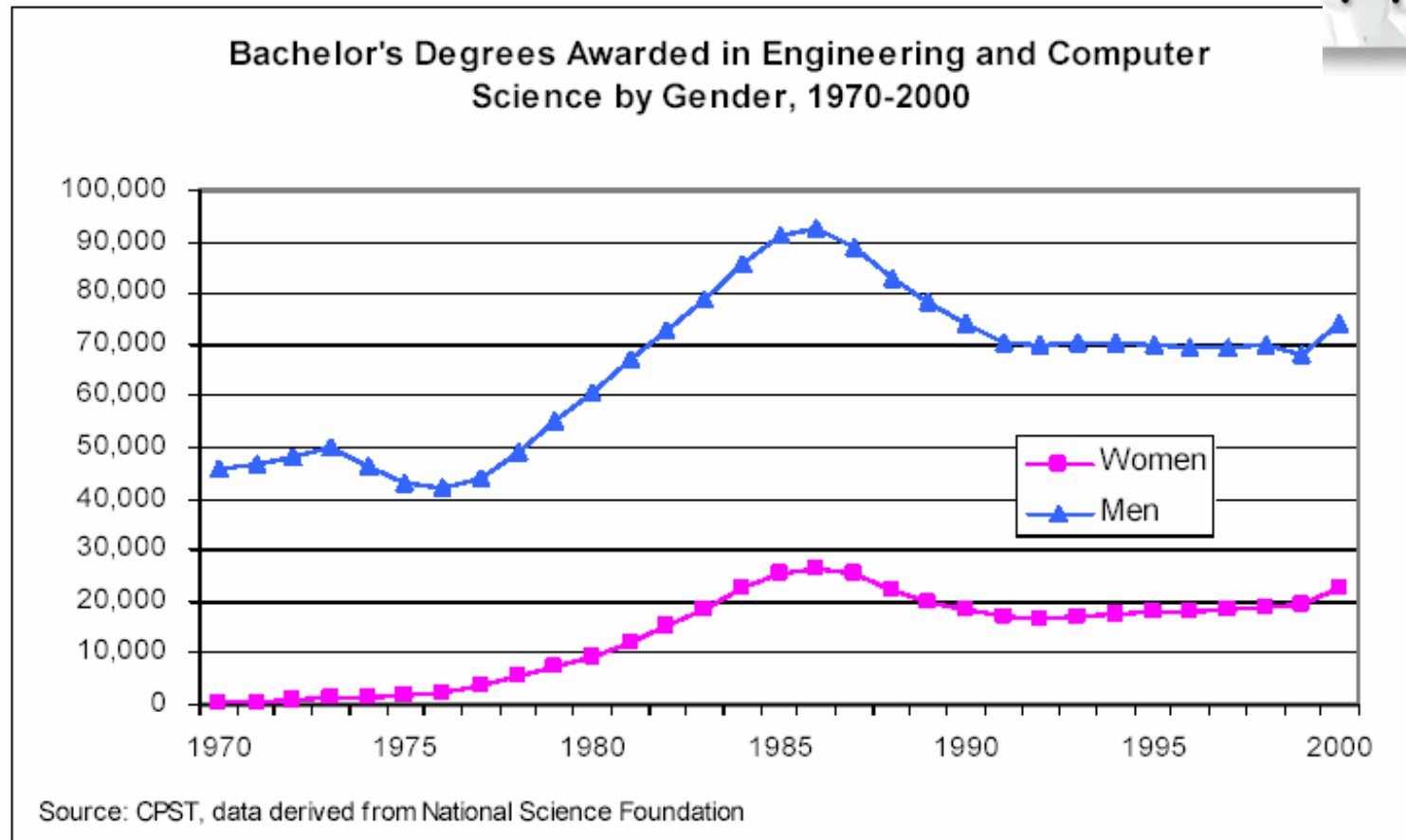
The annual award, administered by the National Science Foundation, includes a \$10,000 grant and a Presidential commemorative certificate.

The 2002 Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring institutional awardees are:

- **WEPAN, Women in Engineering Programs & Advocates Network**
- Shannon Point Marine Center
- Timbuktu Academy
- Raytheon Company College/Pre-College Mentoring Engineering Program
- Strengthening the Understanding of Mathematics and Sciences (SUMS) Institute
- Arizona Mathematics, Engineering, Science Achievement (MESA)



## What is the status of women in engineering today...



Undergraduate engineering enrollment data from the Engineering Workforce Commission find that the proportion of first year women undergraduates in engineering has been dropping over the past five years – from 1996 when they comprised 19.9%, to 2001 when they represented 18.3%.

## WEPAN 2003 Conference – June 8-11, Chicago, IL

### ***"50/50 by 2020: Working Together for Equity"***

- “To achieve the goal of 50 percent women in our institutions and in the workforce by the year 2020, it will take the active partnerships of schools, industry, government, and higher education working together.”
- Events and programs for this year's conference supported the theme of *"Working Together for Equity"*.
- Conference activities included a variety of keynote speakers, oral presentations, poster session, resource room, team problem solving workshops, panel presentations, Lake Michigan dinner cruise, new members breakfast, and more
- 263 Conference Participants
- <http://www.engr.uiuc.edu/wepan>

## WEPAN 2003 Conference – Corporate Sponsors



The Henry Luce Foundation



**Agilent Technologies**



**ExxonMobil**





# WEPAN 2003 Conference – June 8-11, Chicago, IL

## Conference Schedule:

### **Day 1 (Sunday): Career Development Workshops for WIE/WISE Directors, and Hands-on Activities for Youth**

- Sponsored by the Chicago section of the Society of Women Engineers (SWE)

### **Day 2: Focus on Industry**

- Included talks from ANL, and an Industry Panel and Discussion Session with WIE/WISE Directors

### **Day 3: Focus on Faculty and MentorNet Partners Workshop**

- Included Identifying Hidden Gender Issues and Barriers Workshop

### **Day 4: WEPAN Awards Luncheon and Business Meeting**

- DuPont received the Breakthrough Award for creating a work environment that enhances the career success of women engineers

## WEPAN 2003 Conference – Topics Discussed

- Middle school and high school outreach programs
- Images of engineers and engineering
- Identifying hidden gender issues and barriers
- Promoting diversity in the workforce
- Mentoring programs
- Changing learning environments through changing faculty
- Best practices in recruiting and persistence of women in engineering

# ANL Contributions to WEPAN 2003

## *Oral Presentations*

- **Survival Skills For Successful Women Scientists And Engineers – A Series Of Career Development Workshops**
  - By Kirsten Laurin-Kovitz, Dongqi Li , Linda Phaire Washington , Eve Gohoure, Beverly Hartline, and Maryka Bhattacharyya
- **Learning From The World-- A Report On The IUPAP International Conference On Women In Physics**
  - By Dongqi Li and Beverly Hartline

## *Poster Presentation*

- **Argonne National Laboratory's Introduce a Girl to Engineering Day**
  - By Debby Quock, Kirsten Laurin-Kovitz, and Maryka Bhattacharyya



## Conference Participants from ANL



# WEPAN Student Outreach Presentations

- Lawrence Technological University
- Pennsylvania State University
- University of Missouri - Columbia
- Worcester Polytechnic Institute
- Carleton University, Ottawa, Canada
- Maui Economic Development Board, Inc., Hawaii
- University of Cincinnati
- Iowa State University
- U.S. Coast Guard Academy
- Boeing Company
- Kansas State University
- Pharmion Corporation
- New Mexico State University
- University of Technology – Sydney, Australia
- University of Illinois at Urbana - Champaign
- Illinois Institute of Technology
- University of Arizona
- University of Central Florida
- University of Puerto Rico at Humacao
- University of Wisconsin – Madison
- University of Michigan
- Purdue University
- University of Maryland
- Montana State University
- University of Calgary
- Sinclair Community College
- Arizona State University
- University of Utah
- MentorNet
- University of Illinois at Chicago

# Middle School and High School Student Outreach Programs

## Penn State Univ. – Girl Scout Saturdays

- First and second year college students mentor middle school and high school girl scouts with hands-on engineering activities

## Montana State Univ. and Montana Civil Engr. Society – Bridges and Dams

- MSU college students go to elementary schools to visit 2<sup>nd</sup> and 3<sup>rd</sup> graders (...research shows that by age nine, girls already lag behind boys in their hands-on experiences of science)

## Univ. of Missouri - Columbia – Exploring Physics, Electricity & Magnetism

- 8 after school 90-minute physics projects for middle school girls taught by high school science teachers

## Boeing Co. and Kansas State Univ. –

- **GROW**: 3-day summer workshop run by K-State faculty and graduate students for middle school girls
- **Engineer for a Day**: Sponsored by several companies for a day of engineering activities (boys and girls)
- **TWIST**: One-on-one engineer mentoring at Boeing Plant for 9<sup>th</sup> grade young women

# Student Outreach Program – Evaluation Tools

## AWE – Assessing Women in Engineering Project

- Three-year NSF grant to a consortium of universities for developing exportable WIE program assessment instruments and models
- Tools to assess program activities and ultimately to achieve better success in the mission to recruit women into undergraduate engineering programs, and to develop and retain them
- Assessment instruments for commonly implemented student outreach activities (student and mentor surveys)
- Online data entry, collection, and reports (Microsoft Access software)
- Data analysis models
- Professional development workshops and materials focused on assessment, evaluation, and how to leverage results
- National benchmarking to provide data for program development, comparisons, and proposal development

## Lessons Learned – Student Outreach Programs

- *Success Breeds Confidence* - Use hands-on activities
- Food
- T-shirts
- Target middle school girls to instill life-long interest in science (...age 13 is really important)
- Take photographs
- College students as mentors builds leadership skills and reinforces their career choice
- One-on-one mentoring when possible
- Evaluate success and areas for improvement with student and mentor surveys
- Registration fee (regardless of amount) helps ensure attendance
- Advertise event in local newspaper or other media



# Keynote Address – Faculty Diversification

## Diversifying the Faculty: Straight Talk from the Frontline About What Works

*Dr. Myra Gordon, Associate Provost for Diversity and Dual Career Development, Kansas State University*

### Faculty Recruitment Flawed Process

- Faculty Rule: privilege to be part of the process
- Closed Process
- Affirmative Action: Compliance vs. Results oriented
- Faculty unaware of their biases

# Keynote Address – Faculty Diversification

## Biases in process

- Only certain schools produce excellence
- Only people I know can provide trusted recommendations
- Excellence and diversity cannot co-exist
- Women and minorities are not quite good enough

## Study of the Search Committee by Daryl Smith showed

- White men join faculty the “right way”
- Others join as  
Temporary appointment, instructor, visitor, post-doc, etc.

# Keynote Address – Faculty Diversification

## KSU Hiring Partnership Program

- 1 year study/research on search committees
- 1 year observe search committees
- Dean's office review search teams, hold to standard
- Expectation would take 5 years for change
- However:

**Improvements seen almost immediately**

# Keynote Address – Faculty Diversification

## *What worked*

- 1) Active, committed, involved, savvy leadership at Dean's level
- 2) Introduce accountability at Dean's level
- 3) Thoughtfully structured, diverse search committee – use grads, alums, industry, etc.
- 4) Carefully written position descriptions
- 5) Really recruiting/searching for candidates (*all the time!!*)
- 6) Fair evaluation of candidates
- 7) First class campus visits
- 8) Profiles of excellence vs. ranking

## Keynote Address – Faculty Diversification

Recruitment only one part –  
need to *retain* women and minorities!

# Student Mentoring Programs

*WEPAN Conference sponsored by MentorNet*

*“The E-Mentoring Network for Women in Engineering and Science”*

- MentorNet is a non-profit program that pairs **post-secondary women students studying engineering, science and math** with professionals who work in industry for one-on-one mentoring relationships conducted via e-mail

# Benefits of Student Mentoring Programs

## For Students

- Increased confidence in their success in science or engineering
- Increased desire to pursue a career in their field
- Increased desire to work in industry or a government laboratory

## For Colleges & Universities

- Campuses can tap into a vast network of mentors in diverse industries and professional fields
- Student matches with mentors in industry offer greater visibility within the corporate sector for the institution and its academic programs

## For Corporations

- An effective way to further their corporate objective of increasing diversity in the technical and scientific workforce – gain access to a motivated pool of prospective talent, future pipeline
- Large-scale outreach to students from widely-dispersed institutions without effort and cost of travel of university recruiting events
- Professional development for employees – develop mentoring skills, increased motivation

# Translations for Workforce Career Mentoring

## Definition of Mentoring:

*Mentoring is an interaction between a more experienced person and a less experienced person; it provides guidance that motivates the mentored person to take action*

## Protégé vs Mentoring

*Mentoring has diminutive status*

## Resource Person vs Mentoring

## Peer to Peer Mentoring

## Networking or Group Mentoring

## Mentoring Up



# Key Points for Career Mentoring

Need for multiple mentors – one person can't have all the skills

Mentors need training – not an intrinsic skill (soft skills also important)

Define confidentiality expectations

Mentoring is incremental

Difficulty in matching mentors with mentees

Different ways to be mentored – be creative and flexible

*Tips for success*

*Face to face*

*E-mentoring*

*Cluster mentoring*

Mentor is someone who believes in you – maybe more than you believe in yourself

# Diversity Awareness Workshops at Purdue University (Engineering)

- Philosophy: diversity of academia by the faculty
  - Generating the interest and support
  - Develop cross-culture, cross-gender understanding and communication skills
- Why: different from the “top-down” system in industry
  - Faculty (and the deans) rule -- need to understand
- Initially funded by DuPont
  - the 2004 winner of “Breakthrough Award”, which has a mandatory “Expect Respect” training program
- Participation: since 1996, a total of 157 faculty, 73 staff, 80 alumni, and 14 guests attended (~40 in each workshop)

# Making the Case

## -- an issue for the entire faculty

- Multicultural and global economy need diverse workforce
- Attract the best-possible faculty and students
- Better work environment for all!

# Diversity Awareness Workshop: Format

- Voluntary
- Two-and-half days, out of campus retreats
  - First day on multicultural, second on gender
- Outside professional facilitators to set the program and guide the hands-on activities
  - Dialogue
  - Story-telling
  - Lectures
  - Videos
  - Music (black, women, church, ...)

# Diversity Awareness Workshop: Sample Issues

- Dominating groups think they have got all the information
  - “Everything is fine.”
- Communicating vs. problem-solving
- The “feeling aspect”
  - What we appreciate about the other group; what the other group might say about us
  - Which group of people do you have difficulty to communicate with, and why?
- Practical advices
  - Slow down in making judgment
  - Shift the frame of reference
  - Separate intention and impact

# Diversity Awareness Workshop: Keys for success

- Administrative support
  - financial
  - moral
- Make it count
  - promotion, tenure, ...
  - “money talks”
- Invite key people (deans, dept chairs, ...) who are willing to come
- Invite community leaders
- Invite Alumni
  - Relevant, yet willing to talk (Many women faculty would not talk, feeling it would be career threatening.)

# Diversity Awareness Workshop: Keys for Success

- Personal stories touch the hearts
  - more memorable than ideas
- Rules for participants:
  - Open up: “truthfulness with confidentiality”, “intensity with safety” -- anything said at the workshop stays at the workshop
  - No distraction during the workshops

# Diversity Awareness Workshop: Outcomes

- Better understanding of the issues among faculty leaders
- More acceptance for diversity efforts
- Increase of women faculty in engineering in number and percentage
- Modest increase of minority faculty in engineering



# Diversity Awareness Workshop: Costs

Facilitators	\$33-38k
Hotel	\$4-22k*
Misc.	\$1-3k
Total:	\$38-63k

\* saved by hosting the workshops local, by still off-campus

# Diversity Awareness Workshop

***“Diversity starts with the people who are willing to do it!”***

-- Klod Kokini, Assistant Dean of Engineering